

AMENDMENTS TO THE CLAIMS:

1. (Currently amended) ~~In a~~ safety apparatus ~~against for~~ automobile ~~elash~~crash, comprising:
at least one imaging means for picking up ~~an a~~ passenger's head image including a passenger on a seat;

extracting means for extracting passenger's information on the basis of the passenger's head image;

safety means for protecting said passenger ~~against from~~ said automobile ~~elash~~crash; and
controlling means for controlling said safety means on the basis of said passenger's information,

~~characterized in that~~wherein said extracting means:

stores reference images similar to head outlines, a part of which is a part of an ellipse;

detects ~~said a head ellipse in an~~ from the passenger's head image outputted from said imaging means;

stores the detected head ellipse in a form of parameters defining the head ellipse;

judges whether the head ellipse stored in the form of the parameters is almost the same as one of said reference images;

decides the passenger's information responsive to one of the reference images when the head ellipse of the passenger's head image is almost the same as the one of the reference images; and

~~selects one of said reference images almost the same as that of said passenger; and~~

outputs said decided passenger's information included in said selected one of said reference images to the safety means.

2. (Canceled)

3. (Currently amended) The safety apparatus according to ~~claim~~ claim 1, wherein said safety means is an air bag.

4. (Original) The safety apparatus according to claim 1, wherein:
said reference images represent kinds of said passenger; and
said passenger's information is one of said kinds.

5. (Original) The safety apparatus according to claim 1, wherein said extracting means determines that said seat is vacant, if any image almost the same as that of said passenger can not be selected.

6. (Original) The safety apparatus according to claim 1, wherein said passenger's information is a position of said passenger along the front-rear direction.

7. (Currently amended) The safety apparatus according to claim 1, wherein said reference images include the detected ~~image of said passenger including said head~~ ellipse.

8. (Currently amended) The safety apparatus according to claim 7, wherein a region including said detected head ellipse ~~image of said passenger~~ is ~~preferentially~~ processed at a time to come.

9. (Currently amended) The safety apparatus according to claim 8, wherein only said region is ~~preferentially~~ processed.

10. (Currently amended) The safety apparatus according to claim 9, wherein when any image was not detected within said region, a whole of a two dimensional image area is processed at next time to come.

11. (Currently amended) The safety apparatus according to claim 9, wherein when any image was not detected within said region, a whole of a two dimensional image area is further continuously processed.

12. (Canceled)

13. (Original) The safety apparatus according to claim 1, wherein said imaging means is or are disposed at a lateral side of said seat.

14. (Original) The safety apparatus according to claim 1, wherein said imaging means are disposed at both lateral sides of said seat.

15. (Currently amended) The safety apparatus according to claim 1, wherein said imaging means are disposed at a lateral side and a ~~rear~~ front side of said seat.

16. (Currently amended) The safety apparatus according to claim 1, wherein ~~a couple of~~ said imaging means ~~constructs~~ is a stereo range finder having two sensors.

17. (Currently amended) The safety apparatus according to ~~claim 1~~ claim 16, wherein ~~another imaging means~~ the stereo range finder enlarges or reducing-reduces a picked-up image in accordance with a position of the passenger's head measured by said stereo range finder.

18. (New) The safety apparatus according to claim 1, wherein said reference image is limited to said ellipse.

19. (New) The safety apparatus according to according to claim 18, wherein a shape and position of said head ellipse expressed by the parameters are employed for selecting one of said reference images almost the same as that of said passenger.

20. (New) The safety apparatus according to claim 1, wherein the form of the parameters includes at least one of a length of a major axis, a length of a minor axis, values of a center coordinate, an inclination of the major axis and ellipticity.

21. (New) A safety apparatus for automobile crash, comprising:
at least one imaging means for picking up a passenger's head image including a passenger on a seat;
extracting means for extracting passenger's information responsive to the passenger's head image;
safety means for protecting the passenger from the automobile crash; and
controlling means for controlling the safety means responsive to the passenger's information;
wherein the extracting means:
stores reference ellipses similar to head outlines;

picks up a first passenger's head image of the passenger in a predetermined processing region denoting a part of a two dimensional image area;
tries to detect a head ellipse from the first passenger's head image picked up in the predetermined processing region;
picks up a second passenger's head image of the passenger in a whole of the two dimensional image area when no head ellipse is detected from the first passenger's head image;
detects a head ellipse from the second passenger's head image picked up in the whole of the two dimensional image area;
stores the detected head ellipse in a form of parameters defining the head ellipse;
compares a shape and a position of the detected head ellipse expressed by the parameters with each of the reference ellipses to obtain comparison results;
judges responsive to the comparison results whether the head ellipse stored in the form of the parameters is almost the same as one of the reference ellipses;
decides the passenger's information responsive to one of the reference images when the head ellipse of the passenger's head image is almost the same as the one of the reference images; and
outputs the decided passenger's information to the safety means.

22. (New) The safety apparatus according to claim 21, wherein the safety means is an air bag.
23. (New) The safety apparatus according to claim 21, wherein the reference ellipses represent kinds of passengers, and the passenger's information is one of the kinds.
24. (New) The safety apparatus according to claim 21, wherein the extracting means determines that the seat is vacant, if any image almost the same as that of the passenger cannot be selected.
25. (New) The safety apparatus according to claim 21, wherein the passenger's information is a position of the passenger along the front-rear direction.
26. (New) The safety apparatus according to claim 21, wherein the detected head ellipse of the passenger is added to the reference images.
27. (New) The safety apparatus according to claim 21, wherein the imaging means is or are disposed at a lateral side of the seat.
28. (New) The safety apparatus according to claim 21, wherein the imaging means are disposed at both lateral sides of the seat.
29. (New) The safety apparatus according to claim 21, wherein the imaging means are disposed at a lateral side and a front side of the seat.
30. (New) The safety apparatus according to claim 21, wherein the imaging means is a stereo range finder having two sensors.

31. (New) The safety apparatus according to claim 30, wherein the stereo range finder enlarges or reduces a picked-up image in accordance with a position of the passenger's head measured by the stereo range finder.

32. (New) A safety apparatus for automobile crash, comprising:
at least one imaging means for picking up a passenger's head image including a passenger on a seat;
extracting means for extracting passenger's information responsive to the passenger's head image;
safety means for protecting the passenger from the automobile crash; and
controlling means for controlling the safety means responsive to the passenger's information;
wherein the extracting means:
stores reference images similar to head outlines, a part of which is a part of an ellipse;
detects a head ellipse responsive to the passenger's head image outputted from the imaging means;
selects one of the reference images almost the same as that of the passenger;
decides the passenger's information responsive to the selected reference image;
and
outputs the decided passenger's information to the safety means,
wherein the imaging means are disposed at both lateral sides of the seat.